

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 16, 2014

Prepared by
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Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 16, 2014 07:00 to December 17, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, particulate matter (10 micron particles, PM_{10}), sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. An additional unit (Unit 06) was deployed in conjunction with work operations near frac tanks as recommended by the onsite safety officer. Unit 10 was deployed in the cab of a front-end loader supporting solidification operations in the Exclusion Zone. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S , and SO_2 . Unit 02 recorded two instantaneous detections for H_2S during this reporting period of 1 ppm at 09:07 and 09:49. These concentrations were not sustained. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE stations 1, 2, 3 and 4 and data-logged to monitor PM_{10} . The units were taken offline around 01:00 on 12/17 due to rain. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 16, 2014 07:00 – December 17, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	6	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	27	0	NA	<1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	27	0	NA	<1 %
	O ₂	MR+ / MR Pro	27	27	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	6	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	26	26	0.01	0.004 - 0.018 mg/m ³
	SO ₂	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	6	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	27	0	NA	<0.1 ppm
Work Area	Cl ₂	Gastec 8La	4	0	NA	<0.05 ppm
		MR+ / MR Pro	11	0	NA	<0.1 ppm
	H ₂ S	MR+ / MR Pro	31	0	NA	<0.1 ppm
	HCl	Gastec 14L	3	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	41	0	NA	<1 %
	O ₂	MR+ / MR Pro	41	41	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	4	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	19	19	0.015	0.006 - 0.055 mg/m ³
	SO ₂	MR+ / MR Pro	27	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	2	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	42	2	0.1	0.1 - 0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 16, 2014 07:00 – December 17, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Unit 01	H ₂ S	5665	165	0.1 ppm	0.1 - 0.2 ppm
	LEL	5665	0	NA	< 1 %
	SO ₂	5665	111	0.1 ppm	0.1 - 0.1 ppm
	VOC	5665	2	0.1 ppm	0.1 - 0.1 ppm
Unit 02	H ₂ S	5678	174	0.2 ppm	0.1 - 1.3 ppm
	LEL	5678	0	NA	< 1 %
	SO ₂	5678	3	0.1 ppm	0.1 - 0.1 ppm
	VOC	5678	387	0.1 ppm	0.1 - 0.4 ppm
Unit 03	H ₂ S	5607	157	0.1 ppm	0.1 - 0.1 ppm
	LEL	5607	0	NA	< 1 %
	SO ₂	5607	0	NA	< 0.1 ppm
	VOC	5607	786	0.1 ppm	0.1 - 0.7 ppm
Unit 04	H ₂ S	5650	2	0.1 ppm	0.1 - 0.1 ppm
	LEL	5650	0	NA	< 1 %
	SO ₂	5650	0	NA	< 0.1 ppm
	VOC	5650	22	0.1 ppm	0.1 - 0.2 ppm
Unit 06	H ₂ S	2151	470	0.1 ppm	0.1 - 0.1 ppm
	LEL	2151	0	NA	< 1 %
	SO ₂	2151	0	NA	< 0.1 ppm
	VOC	2151	329	0.1 ppm	0.1 - 0.3 ppm
Unit 10	H ₂ S	1928	43	0.1 ppm	0.1 - 0.2 ppm
	LEL	1928	0	NA	< 1 %
	SO ₂	1928	2	0.1 ppm	0.1 - 0.1 ppm
	VOC	1928	264	0.4 ppm	0.1 - 0.8 ppm

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²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM₁₀ Monitoring Summary¹
December 16, 2014 07:00 – December 17, 2014 07:00

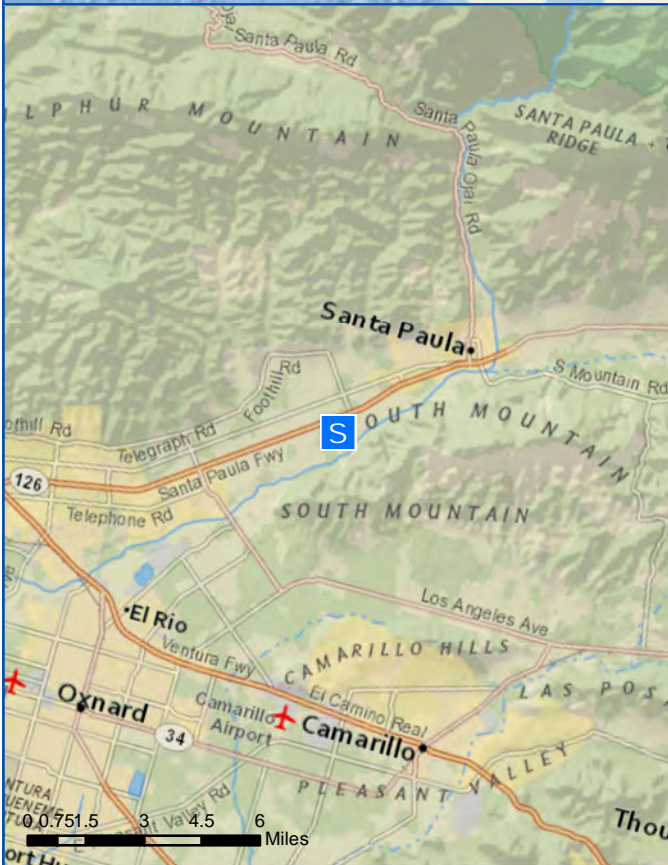
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	2331	2282	0.008	0.001 - 0.485 mg/m ³
10408087	AR02	2359	2310	0.009	0.001 - 0.331 mg/m ³
10704074	AR03	2407	2362	0.008	0.001 - 0.982 mg/m ³

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

Appendix A

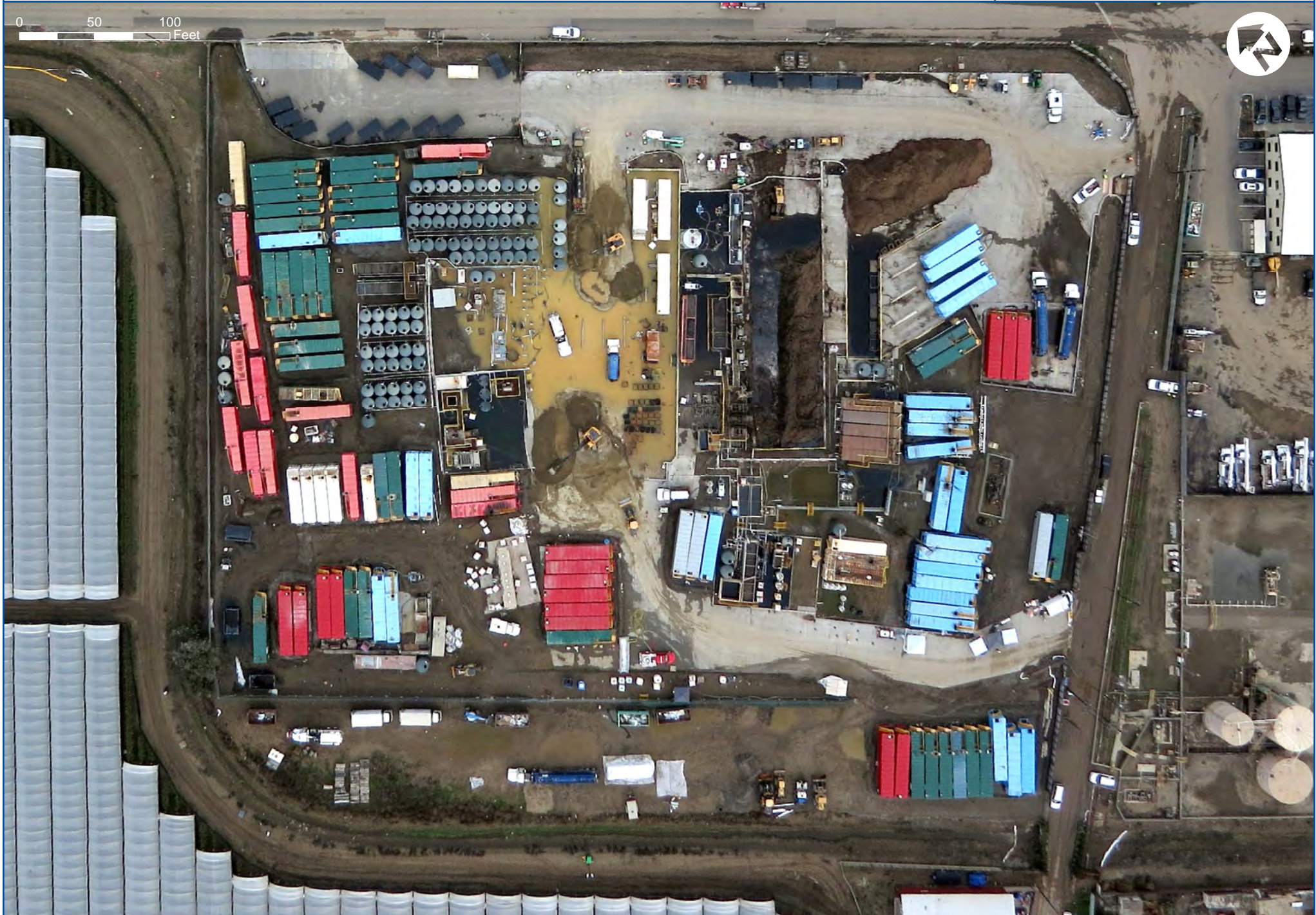
Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend
 Site Location

0 50 100 Feet



0 250 500 1,000
Feet



Legend

- FRT Location
- Site Location



Legend

Monitoring Location

- Detect (0.1 - 0.1 ppm)
- Non-detect (< 0.1 ppm)
- Incident Site



Legend

Monitoring Location

- Non-detect (< 0.2 mg/m³)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site



Legend

Monitoring Location

- Detect (0.004 - 0.055 mg/m³)
- S Incident Site







Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 1 %)
- S Incident Site



Legend

Monitoring Location

- Non-detect (< 0.1 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles





Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

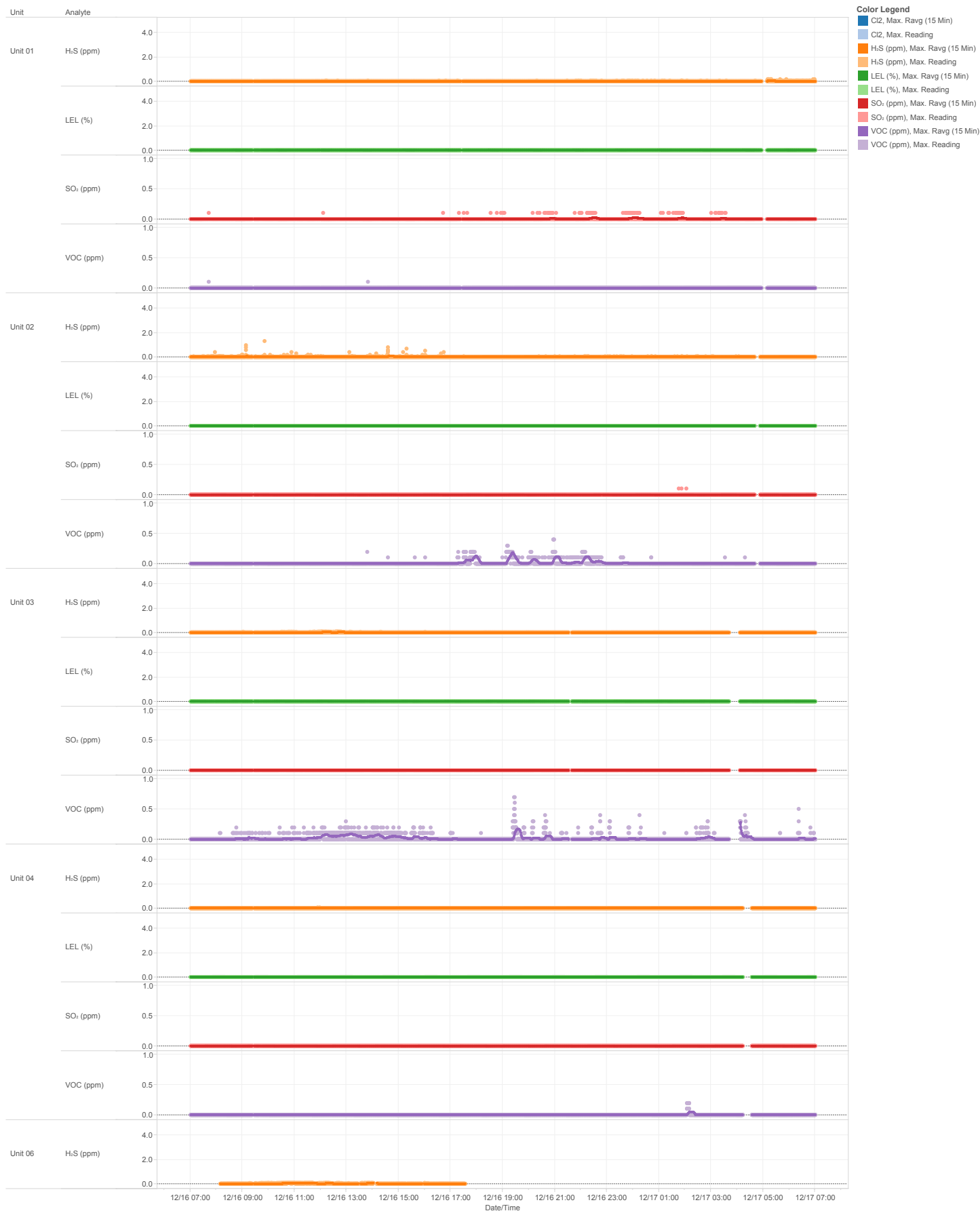
0 50 100 Feet



Legend

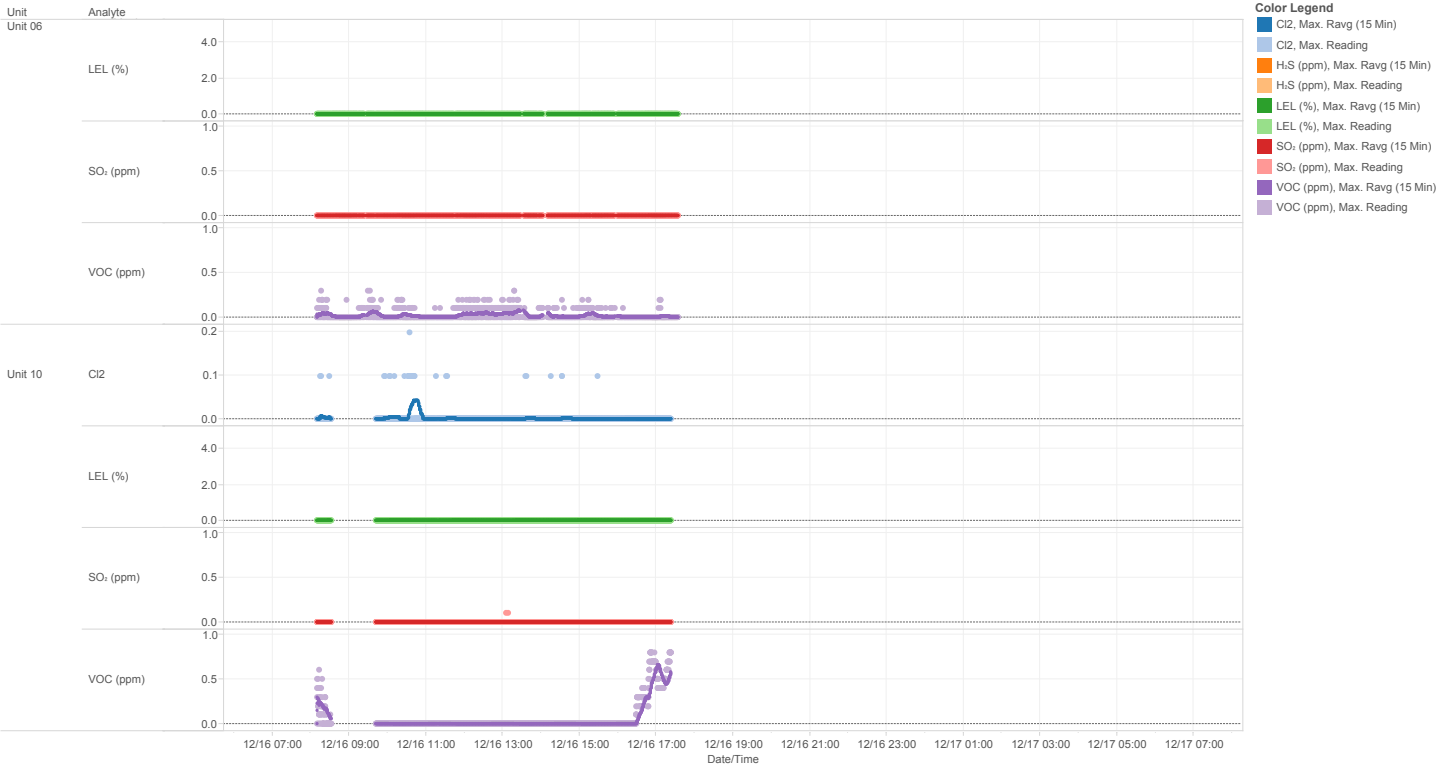
-  AreaRAE & AM510 Station
-  AreaRAE Station

Patriot Environmental
AreaRAE Trend Graphs
12/16/2014 07:00 - 12/17/2014 07:00



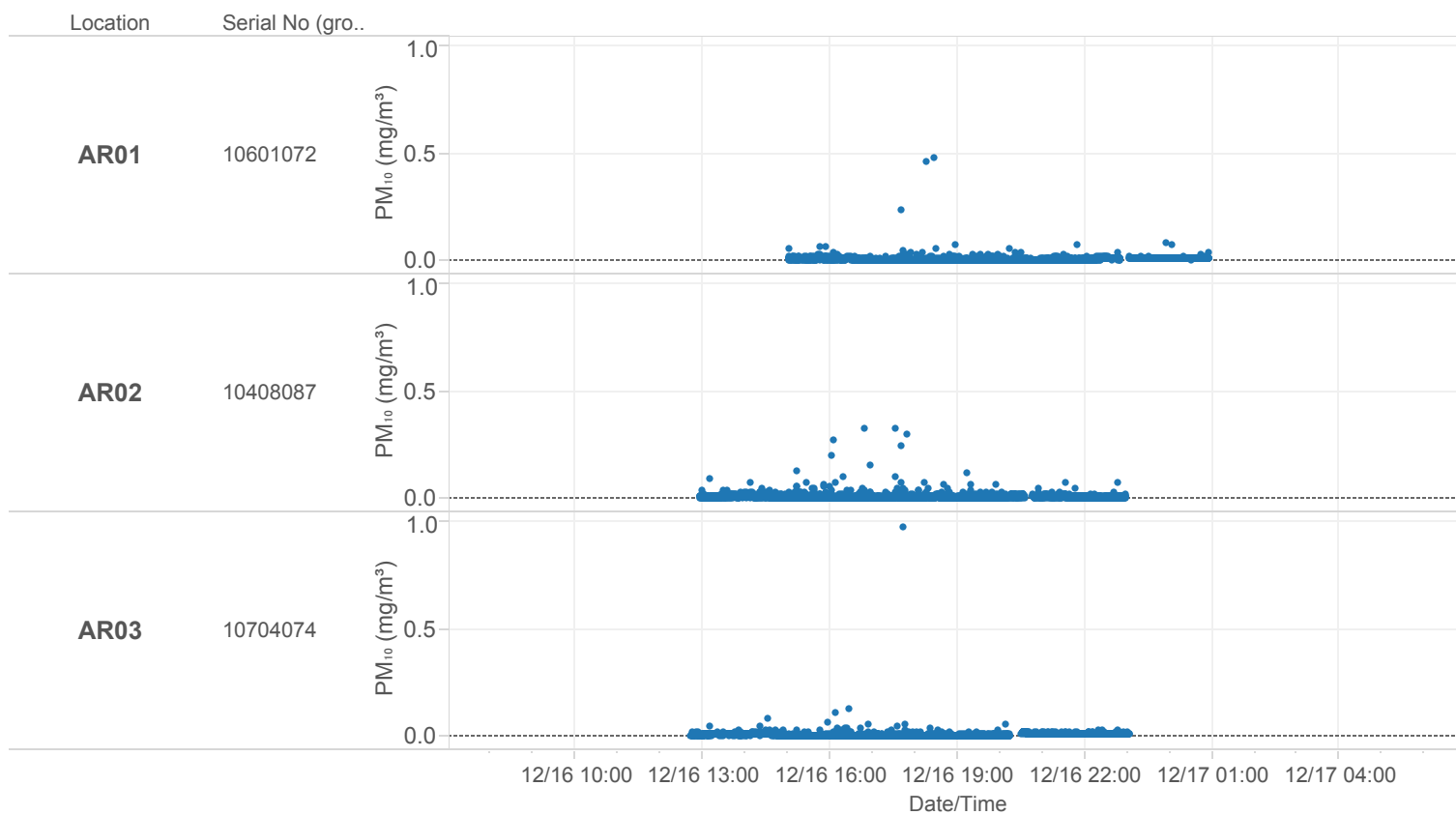
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/16/2014 07:00 - 12/17/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/16/2014 07:00 - 12/17/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format